

WHAT IS CLAIMED IS:

1. A disk Drive comprising:

a head which reads out data from a disk medium;

and

5 a read channel which decodes a data signal of concatenated turbo codes read out by the head and reproduces original data,

wherein the read channel has:

10 a detection unit which detects burst noise contained in the data signal; and

 an iterative decoding unit which executes iterative decoding processing including a posteriori probability decoding processing (APP decoding processing) to the data signal, the iterative decoding unit changing contents of likelihood calculation for carrying out the decoding calculation according to the detection result by the detection unit.

20 2. The disk drive according to claim 1, further comprising an error correction unit which executes error correction processing to data reproduced by the read channel, the error correction unit executing the error correction processing including erasure correction according to the detection result by the detection unit.

25 3. The disk drive according to claim 1, wherein the detection unit detects the burst noise generated in read operation by the head according to an amplitude

value of the data signal and outputs binary flag information as the detection result.

4. The disk drive according to claim 1, wherein the iterative decoding unit executes the APP decoding processing of an inner code to the data signal of the concatenated turbo code using a recursive convolutional code as an outer code and includes: a first APP decoding unit which changes the contents of the likelihood calculation according to the detection result by the detection unit; and a second APP decoding unit which executes the APP decoding processing of the outer code.

5. The disk drive according to claim 1, wherein the iterative decoding unit executes the APP decoding processing of an inner code to the data signal of the concatenated turbo code using a recursive convolutional code as an outer code and includes: a first APP decoding unit which changes the contents of the likelihood calculation according to the detection result by the detection unit; a second APP decoding unit which executes the APP decoding processing of the outer code; and a hard decision unit to decide a final decoding sequence from output of the second APP decoding unit.

6. A read channel for decoding a data signal of a concatenated turbo code in a disk drive having a head reading out the data signal from a disk medium,

comprising:

a detection unit which detects burst noise contained in the data signal read out by the head; and

an iterative decoding unit which executes
5 iterative decoding processing including a posteriori probability decoding processing (APP decoding processing) to the data signal, the iterative decoding unit changing contents of likelihood calculation for carrying out the decoding calculation according to the
10 detection result by the detection unit.

7. The read channel according to claim 6, further comprising: an A/D converter which converts the data signal read out by the head into a digital signal and an equalizer which executes waveform equalizing
15 processing by a partial response method to the digital signal, wherein

the detection unit detects the burst noise on the basis of an amplitude value of the digital signal outputted from the A/D converter, and

20 the iterative decoding unit executes iterative decoding processing to the data signal outputted from the equalizer.

8. The read channel according to claim 6, wherein the detection unit detects the burst noise generated in
25 read operation by the head according to the amplitude value of the data signal and outputs binary flag information as the detection result.

9. The read channel according to claim 6, wherein the iterative decoding unit executes the APP decoding processing of an inner code to the data signal of the concatenated turbo code using a recursive convolutional code as an outer code and includes: a first APP decoding unit which changes the contents of the likelihood calculation according to the detection result by the detection unit and a second APP decoding unit which executes the APP decoding processing of the outer code.

10. The read channel according to claim 6, wherein the iterative decoding unit executes the APP decoding processing of an inner code to the data signal of the concatenated turbo code using a recursive convolutional code as an outer code and includes: a first APP decoding unit which changes the contents of the likelihood calculation according to the detection result by the detection unit; a second APP decoding unit which executes the APP decoding processing of the outer code; and a hard decision unit to decide a final decoding sequence from output of the second APP decoding unit.

11. The read channel according to claim 6, wherein the disk drive has an error correction unit which executes error correction processing including erasure correction to data reproduced by the read channel, and the detection unit is configured to output information

showing that the burst noise has been detected to the error correction unit and direct execution of the erasure correction in the error correction processing of the error correction unit.

5 12. A method of decoding a data signal of a concatenated turbo code in a disk drive having a head reading out the data signal from a disk medium, comprising:

 detecting burst noise contained in the data signal
10 read out by the head; and

 when iterative decoding including a posteriori probability decoding processing (APP decoding processing) is executed to the data signal, changing contents of likelihood calculation for carrying out
15 calculation of the iterative decoding according to the detection result by the detecting.

 13. A method according to claim 12, wherein the iterative decoding includes, when the APP decoding of an inner code is executed to the data signal of the
20 concatenated turbo code using a recursive convolutional code as an outer code, first APP decoding for changing the contents of the likelihood calculation according to the detection result by the detecting and second APP decoding for executing the APP decoding processing of
25 the outer code.

 14. A method according to claim 12, wherein the iterative decoding includes, when the APP decoding

of the inner code is executed to the data signal of
the concatenated turbo code using the recursive
convolutional code as the outer code, first APP
decoding for changing the contents of the likelihood
5 calculation according to the detection result by the
detection, second APP decoding for executing the APP
decoding processing of the outer code, and hard
decision processing for deciding a final decoding
sequence from decoding output by the second APP
10 decoding.

15. A method according to claim 12, further
comprising executing error correction including erasure
correction to reproduced data according to the
detection result of the burst noise by the detecting.